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## Expression patterns of the human papillomavirus type 16 transcription factor E2 in low- and high-grade cervical intraepithelial neoplasia.

Maitland NJ, Conway S, Wilkinson NS, Ramsdale J, Morris JR, Sander CM, Burns JE, Stern PL, Wells M.

Department of Biology, University of York, U.K. njm9@york.ac.uk

Specific antibodies against the C-terminus of E2, produced by affinity purification of polyclonal antisera, have been used to identify the cellular populations which express the HPV 16 E2 transcription factor, in a series of formalin-fixed, paraffin-embedded cervical tissues. Cases were selected for both the presence of HPV 16 DNA (confirmed by multiple gene-specific PCR detections) and the presence of multiple grades of cervical intraepithelial neoplasia (CIN). The data indicate that E2 expression is highest in CIN I and in koilocytic lesions. Lower expression was observed in CIN II and little in CIN III lesions. In contrast, there was some restoration of E2 expression in invasive carcinomas, although the intracellular distribution was much more diffuse. The location of E2 expression to the superficial layers of the cervical epithelium, as well as the occurrence of some basal expression in CIN I, suggests that antibodies against HPV 16 E2 could be a useful adjunct to standard histological techniques for the detection of 'at-risk' patients as part of a cervical screening programme.

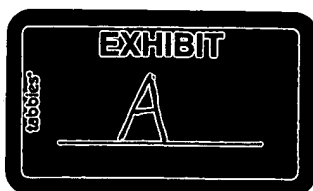
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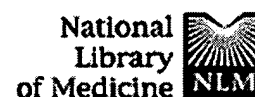
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**ELSEVIER**  
**FULLTEXT ARTICLE****Overexpression, purification, and structural analysis of the hydrophobic E5 protein from human papillomavirus type 16.****Yang DH, Wildeman AG, Sharom FJ.**

Department of Chemistry and Biochemistry, University of Guelph, Guelph, Ont., Canada N1G 2W1.

The E5 proteins of human papillomavirus (HPV) are highly hydrophobic transmembrane proteins that display weak transforming activity. The HPV E5 proteins are localized largely to intracellular membranes, such as the Golgi apparatus and endoplasmic reticulum, but also appear in the plasma membrane. Infection with HPV16 is the cause of over 90% of human cervical cancers. HPV E5 is known to interact with growth factor receptors and gap junction proteins and is believed to play a role during the initiation of neoplasia. The structure of HPV E5 and the mechanism of its interactions with growth factor receptors remain largely unknown. In the present studies, the E5 protein of HPV16 was cloned into the pBAD/TOPO vector fused to an N-terminal thioredoxin leader and a C-terminal His-tag, and expressed in *Escherichia coli*. The identity of the protein was confirmed by immunoblotting using antibodies against a V5-epitope tag engineered into the protein. Due to formation of high molecular mass superaggregates of the protein, two chromatography steps were employed for its purification: (1) gel filtration chromatography to separate the superaggregated protein from other soluble proteins and (2) Ni-chelate affinity chromatography in the presence of detergent. The superaggregates of the E5-fusion protein were broken down to monomers and various oligomers by sonication in the presence of 0.2% SDS. The purified E5-fusion protein was then reconstituted into lipid vesicles and initial structural analysis of the protein was performed using circular dichroism spectroscopy.

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